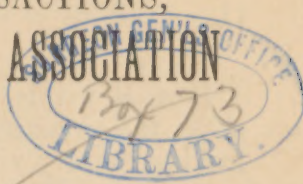


Simons (M) With the Compliments of
Manning Simons

EXTRACTS FROM TRANSACTIONS,
SOUTH CAROLINA MEDICAL ASSOCIATION
1878.

[PAPER B.]



A Note on the Epidemic of Yellow Fever at Port Royal in 1877.—By Manning Simons, M. D., Charleston, S. C.

The study of the natural history of disease, including its origin, mode of extension and propagation, and its clinical history, presents a most important subject to the working physician.

Every contribution, therefore, bearing upon this investigation, is of importance; for whilst no great principle may be established, or discovery revealed by it, yet, added to the mass of information obtained in this way, when subjected to the process of analysis, valuable and missing links in the history of disease may be found and applied to useful end.

It is with this reflection that we are induced to offer to the Association, in the form of this note, our observations in the epidemic that prevailed at Port Royal during the latter part of the past summer, and our deductions derived from them.

On the afternoon of October 2d, we were requested by the President of the Medical Society of South Carolina to respond to a call for medical aid, that he had just received from Port Royal. It was stated that the nature of the disease was undecided, but that the opinion had been expressed that it was malarial. The next morning, at 10.30 o'clock, we arrived at Port Royal.

As preliminary to our remarks, it would be well to say a few words about the topography of the country, the situation, construction, and general character of the town, in their relation to hygiene and sanitation, and especially in connection with the epidemic under consideration.

Port Royal is not a city; it is a scattering, and, under the circumstances in which we saw it, unhappy looking country village, located at the south easterly extremity of Beaufort Island, with Battery River on the south-west and Beaufort River on the north-east.

It commands a view of Broad River, marred somewhat by a plat of marsh, of irregular, triangular shape, at the further point of which the Beaufort and Battery Rivers diverge from each other, to follow their respective courses.

The situation of Port Royal is elevated, constituting what, in some localities, might be complimented with the term "bluff." The soil is much of the sandy nature of the Sea Islands, except at certain low points, where it possesses the dark, rich appearance of alluvial lands.

With the exception of one or two places, notably in the region of the depot of the Port Royal Railroad, the drainage appeared to us to be good, and easily accomplished through the natural advantages offered by the elevated situation of the town.

The season of our visit was favorable for observation of the drainage of the place, for rain had fallen continuously for some time before, and it continued to rain for days after our arrival.

The rapidity with which this volume of water was greedily absorbed by the porous sandy soil, and flowed off, was good evidence of the drainage.

The town and its surroundings were but sparingly shaded with trees, and such as were there, were small and scattered oaks. Whether this absence of trees was due to the work of the axe or to original failure of growth, we did not discover, but are inclined to attribute it to the latter cause. About a mile from the town, at too great a distance to affect it either beneficially or otherwise, is a magnificent grove of oaks, in the immediate neighborhood of the old Spanish fort, on the Beaufort River. This grove, with its massive columns,

beautiful vistas, and wide spreading arches festooned with moss, well merits the term, "nature's cathedral."

The town of Port Royal, its immediate vicinity, and indeed nearly the whole Island, was covered, as far as the eye could reach, with a little plant, about two feet high, bearing a yellow flower, which gave to the country the appearance of a carpeting of brilliant shade. This plant has been classified as *Solidago Vulgaris*—common name, Golden Rod.

The houses are scattered and irregular in arrangement, occupying an area of nearly a half mile square; and although the town is on the map laid out into avenues, streets and squares, the building has as yet not assumed a symmetrical form.

The houses are, with but one or two exceptions, of wood, with abundant space and free ventilation, and a casual inspection at once removes from the mind the impression that crowding together of the inhabitants was the cause of disease.

On the water front are located the extensive warehouses and wharves of the Port Royal Railroad, and it is within stone's throw of these structures that the main portion of the town is clustered. The streets are, of course, unpaved, either with stone or wood, the sandy soil forming them and the country roads alike.

The water supply is derived principally from recently made wells, and appeared to be pure and wholesome.

In going over this town, into the houses and yards, we found nothing which could be considered unsanitary; no collections of filth about the premises, no foul privies or cess pools, and no collections of stagnant water.

On all sides could be seen the results of the work of the energetic chairman of the corporation Board of Health. Even during the existence of the epidemic, car loads of pure sand and gravel were brought from miles away, and all damp places were in this manner filled up.

This region has always been subject to malarial fevers, and indeed the reputation that it had in this respect was well sustained during the past summer ; but it had never before been invaded by Yellow Fever.

These facts rendered the study of the epidemic under consideration, of special interest to the student of the last named disease, both in its clinical relations and as to its causation.

Although in this country we have unfortunately had but too frequent opportunities to study Yellow Fever in all its phases, yet there still seems to be much doubt in the minds of physicians, not only as to its origin, but in respect to its diagnosis. The early history of each epidemic is marked by the same discussion as to the nature of the disease in hand, and the same differences of opinion in relation to the source whence it originated.

On the one hand are those who hold to the theory that Yellow Fever is always due to importation, either directly, by the bringing of the fresh germs, or indirectly, to the revivification and propagation of germs remaining from a preceding epidemic. On the other hand are those who believe that within certain geographical limits the disease springs up, *de novo*, from the combined operation of unknown influences.

So far as the clinical history of the disease is concerned, elements of doubt have been gradually permitted, until at the present day, it has become difficult to say in what groupings of symptoms Yellow Fever manifests itself. The clearly defined, well developed disease, affords no ground for doubt ; but by a system of generalization, and by the recognition of mild forms, we have been borne away, as it were, upon one of those waves of recession that so often sweep down the landmarks of things before supposed to be settled.

Again ; the recognition, or at least the theory advanced by some as to the existence of a malarial Yellow Fever, has added another difficulty to this already

complex subject. Under these circumstances, in the beginning of every epidemic of Yellow Fever, we hear of a malignant fever spreading rapidly, some of the cases of which present well marked characteristics of Yellow Fever, but a doubt still hangs over the diagnosis.

The occurrence of this epidemic, for the first time, in a malarial district, among an unacclimated population, presents an unusually favorable field for the study of some of these points of contention.

In this note we propose to lay before you, for your consideration, some observations made by us, and confirmed, so far as the care with which they were conducted is concerned, by our colleagues who were present and worked in the terrible battle with this plague.

The identity of the disease is unquestionable; so that it is unnecessary for us to go over the ground of the symptomatology, with which you are all doubtless familiar. It is scarcely necessary for us to draw an outline; to describe the onset with chill, or sensations of chilliness; the immediately following pain in the head, back and limbs; the rapidly rising fever of intense grade; the red and injected watery eyes; the sluggish capillary circulation; the inward heat, pain, and tenderness on pressure over the epigastrium; the irritable stomach; the black vomit; the albuminous urine; the suppression of this secretion; the hemorrhages, and the rapid course of the disease, and the mahogany coloring of the skin.

There are, however, some points in connection with the clinical history of the disease to which we desire to direct your attention:

First—As to the period of incubation: For obvious reasons, it is usually almost impossible to decide upon the period of incubation of disease. To determine the exact date of exposure, to estimate the peculiar predisposition or liability to the disease to which there

may be exposure, and to discover the vulnerability to disease of individuals, are all elements to be considered as bearing upon the period required by the disease poison to manifest its influence on the human organism, by the special train or grouping of symptoms characteristic of it.

With regard to Yellow Fever, it is not requiring too much of us to admit that an individual who has lived in that region included in the geographical limits assigned to that disease, who has not, however, passed through an epidemic, may have become so far inured to the peculiar climatic influences, as to lengthen the period of incubation; whilst, on the other hand, an individual fresh from colder latitudes, if suddenly introduced, without such preparation, into the atmosphere of an epidemic in its full force, would develop the disease after a brief period of latency.

The facts afforded by the epidemic under consideration, appear to us to warrant the theory just ventured. There seemed to be no fixed time for the incubation of the disease, and the time between the exposure and its manifestations appeared to us to have been directly influenced by the circumstances above mentioned.

Illustrative of the first assumption that we have ventured to make, we relate the case of Mr. Stickney, who had lived in Port Royal for some time, and during the epidemic worked actively, attending the sick; he nursed two of the most malignant cases, breathing daily and nightly the atmosphere of the sick room. This individual passed safely through the epidemic nearly to its termination, and then sickened, presenting one of the last evidences of the expiring influence of the poison. His case was severe, but he passed through it safely.

On the other hand, Mr. Weil, an Alsatian, arrived in Port Royal on October 1st, for the purpose of opening a store, having heard nothing of the epidemic, for its nature was not definitely settled until the 3rd. On

the night of the following Wednesday, October 3d, he was attacked with Yellow Fever, and died in sixty hours.

These two instances represent the variations which exist, so far as the stage of incubation is concerned, and they seem to us to justify the theory that we have offered to account for the different and unsettled periods of latency assigned to Yellow Fever.

Second—Some points in the clinical history of the disease: The disease was almost invariably ushered in with a chill—in a very small number of cases by sensations of chilliness and headache—then followed fever.

Yellow Fever has been described as a fever of one paroxysm, followed by what is called the stage of calm, and supposed to be an apyrexial period; the disease then terminated with this stage, or passed into a third stage, which might or might not be marked by pyrexia. The thermometer has proved this to be a fallacy, and that the second stage is not one of apyrexia, but that in many cases the temperature remains considerably above the normal standard, although it does not retain the height of the first stage.

The epidemic under consideration has developed yet other terminations of this disease.

Many cases were marked by an abrupt termination of the pyrexia, and at the same time of the disease. At the end of forty-eight hours, perhaps seventy-two, but usually the former, the fever began a rapid descent, collapse supervening, and death promptly followed. The disease may terminate in this way in so short a time as forty-eight hours. Again, the fever passed on in other cases to an adynamic form, lasting fourteen days or more, involving the nervous system, and presenting the symptoms of so-called uræmic poisoning.

Third—The temperature: Dr. Joseph Jones, of New Orleans, has given to the profession an admirable article on the temperature and pulse in Yellow Fever. His conclusions are, that the maximum of temperature

is reached on the first, second, and third days; from the third to the fifth it sinks down, to or below the normal standard. In some fatal cases it rises again toward the end, but rarely reaches or exceeds 104° in the stage of passive hemorrhages, black vomit, jaundice, and urinary suppression.

Observations on the variations between the morning and evening temperatures have produced nothing certain, or, at least, no uniformity has been seen.

Dr. Jones speaks of temperatures from 107° to 110° , and assigns to them, invariably, fatal prognosis. He says, that "if the thermometric changes in Yellow Fever be projected upon a chart, and a comparison instituted with thermometric changes in other diseases, it will be found that the former more nearly resemble the rapid rise and fall of temperature observed in varioloid without secondary fever, mild scarlatina, and simple pneumonia without fresh accessions of inflammatory action, while on the other hand, they differ materially from the rapid and oft recurring elevations and depressions of temperature characteristic of paroxysmal malarial fever." Sudden fall of temperature during the succeeding stage of calm is spoken of.

In the epidemic of Charleston in 1871, we made a number of thermometric observations, and through the kindness of our professional friends, had the opportunity of studying the records of their cases.

As a result of the study of these observations, in a report to the American Medical Association, we made the following remarks:

"Our thermometric records are too few to permit us to hazard an assertion, but we are prepared to admit that the febrile movement of Yellow Fever is characterized by remissions in an eight hour cycle. In making this statement, we desire to be distinctly understood as not intending to confound remittent fever, due to malaria, with specific Yellow Fever."

"In the second stage, or stage of calm, though the

skin may return to the normal or go below, the temperature remains high in most cases, falling somewhat in certain instances at the time of the occurrence of black vomit."

In substantiation of this view, we gave charts of the thermometric observations.

Our experience in the epidemic at Port Royal, and the thermometric observations there taken, differ somewhat from the results obtained by Dr. Jones, and require that we should modify, in some respects, the views that we have given in the paper alluded to above.

The differences in our thermometric records for 1871 and 1877, may be accounted for, partly by reason of the fact that the epidemic of 1871 possessed the peculiarity of presenting many cases of mild, ephemeral forms of fever on the one hand, marked Yellow Fever on the other, and still other classes of cases occupying a middle position between the two.

On a previous occasion we have given expression to our inclination to make a distinction between these forms of fever, and not to class them under the same term, and at the same time gave reasons for our belief in their dissimilarity.

These circumstances rendered the study of the thermometry of the Yellow Fever difficult, and incline us to accept the observations made at Port Royal, as nearer to the true range of the temperature of the disease, as the epidemic was not characterized by mongrel types, nor was there any prevalence of ephemeral fever or "break bone fever."

In the first place, the temperature rose rapidly after the initial chill; the time between the chill and the maximum of the fever varied but little; the first observation gave, in almost all instances, the highest point reached in the course of the fever. In this feature the thermometer-range was essentially different from the gradual progressive advance characteristic of Typhoid

Fever, and corresponded with the sudden rise of malarial remittent.

For the first forty-eight hours there was but little variation in the temperature, and there was no difference, as a rule, between the observations of the morning, noon, and evening. In other words, there was no exacerbation of the fever towards evening, and no modification in the morning.

This peculiarity was well shown in the case of Mr. Center. We saw the patient within half an hour of the chill, and found the temperature at 105° , which point it maintained at each subsequent observation, until it began a precipitous descent.

So far as our observations went, there were no extremely high temperatures; 105° and 105.5° were the highest observed by us.

In one instance, a temperature of 110° was reported, but within ten minutes after the note was taken, another observation made by us, with the same thermometer and our own, in the mouth, at the same time, gave 105° . The only reason assigned for this change was that the patient had been rubbed with Tincture of Capsicum. Subsequent observations, however, never gave more than 105° in this case.

After the first forty-eight hours the temperature-range varied with the type of the individual cases.

For instance: in some cases, at the end of forty-eight hours, the temperature began a precipitous descent, passing, in the course of an hour, below the normal.

In these cases the patients died without black vomit or hemorrhages, in a state of collapse. The cases of Mr. Weil and Mr. Center were instances of this kind.

In the case of Mr. Weil, an observation in the morning gave 105° ; in the evening the temperature began its rapid fall; by 8 o'clock it got below the normal, and before morning the patient was dead.

Again, in other cases, where the disease did not run such a rapid course, there was diminution in the second stage, but the temperature would remain at 104° or 103° , with no regular variations between morning and evening, and it was by no means unusual—indeed it was the rule—to see patients for days (as in the instances of Mr. Kent and Mr. Keener for six days) vomiting black vomit, with a temperature of 104° .

With the exception of the cases terminating at the end of forty-eight or seventy hours in rapid collapse, a sudden and marked fall of the temperature in the second stage formed an exception to the rule.

In other rare cases the disease ran into an adynamic form of fever, the temperature for fourteen days and more being above the normal, but marked by no regularity.

From our observations we are not able to say that the temperature-range of Yellow Fever is yet decided, nor can we admit, with the present developments, that this is distinctive, as in Typhoid Fever.

It is probable that when many more observations have been made in the same and different epidemics, and charts analyzed and compared, something more definite may be evolved out of the present uncertainty. Certain it is that we are not yet prepared to admit, so far as our observations go, that it resembles in its rapid fall "the temperature observed in varioloid without secondary fever, mild scarlatina, and simple, uncomplicated pneumonia which runs its course without fresh accessions of inflammatory action."

It is plain, however, that the range of the thermometer differs materially "from the rapid and oft-recurring elevations and depressions of temperature characteristic of the various forms of paroxysmal malarial fever," whilst it is similar in the very rapid rise of the heat of body in the inception of the disease, and the rapidity with which the maximum point is reached; differing, in this respect, from the characteristic temperature-range of the

first few days of Typhoid, and in the daily variations between morning and evening, observed in the last named disease.

In considering the uncertainty, in a diagnostic point of view, of the temperature of Yellow Fever, we must remember always that different epidemics of this fever are subject to variations, depending upon situation and population.

The circulatory system presents points of interest; and, in this respect, the epidemic under consideration confirms observations already made.

The peculiar inverse ratio of pulse and temperature has been frequently noted, and our observations offer no exception to the rule established.

The pulse beat presented nothing peculiar in the first twenty-four hours of the fever, bearing to the temperature about the proportion that is commonly observed in the early stages of most acute febrile diseases, being increased in frequency, and generally full and bounding.

After this period, however, the disproportion between the high temperature-range and the frequency of the pulse is observable; it then begins to acquire a less rate than we would expect from the high febrile state. This slowness of pulse became more marked as the disease advanced; it was not unusual to find associated a temperature of 104° , or even higher, with a pulse of 80, 70, and even 60 beats to the minute.

This peculiarity became more marked in the stage of calm, when the "solemnity of the pulse" was developed, which forms one of the most striking features of this disease.

A slow pulse has been observed as a characteristic of the convalescent stage, and, as a rule, this is true; but attention should be called to the fact that the pulse frequently runs up to great frequency in this period. This is a most important point, of the highest practical interest. The slightest mental or physical exertion is often, under such circumstances, sufficient to deter-

mine a most rapid, alarming and dangerous rise in the frequency of the pulse. Indeed this has, in more than one instance, caused the fatal termination of cases to all appearances passing rapidly to favorable result.

This fact should not cause surprise when we review the features of the disease, and take into consideration the morphological changes caused by the long continued high temperature; of these metamorphoses, nutritive changes in the heart form those which should command the most earnest solicitude, and prompt the utmost care in the management of the stage of convalescence.

In the second stage, and indeed in the stages subsequent to the first, the sluggishness of the capillary circulation, with tendency to stasis and congestions, was marked, and offered a most prominent indication in the treatment during the epidemic.

In these stages of the disease, if the hand be pressed upon the surface of the body, notably on the chest, the marks of the fingers would be left where the blood had been pressed from the capillaries and other small vessels superficially located, the color only slowly and gradually returning to the part.

Hemorrhages from the mucous surfaces and blistered areas formed a prominent feature of the epidemic, pointing out the malignant type, and the rapid and profound disorganization of the blood and vessels.

In connection with the digestive system, we have no observations of interest to offer, except, perhaps, to call attention to one or two points, which, by the frequency with which they were noted, forced themselves upon our consideration.

First, we would mention that in addition to the epigastric pain and tenderness that have been so often pointed out as symptoms, all patients, with but few exceptions, complained bitterly of intense, burning pain, extending from the fauces to the epigastrium, deeply seated within the cavities of the body.

This pain was described as like that produced by the

swallowing of some intensely heated liquid, increased when anything, even iced water, was taken, and formed one of the most prominent symptoms of the epidemic.

The occurrence of black vomit was common to almost all cases, if we except the colored people, and even among them it was more than once observed. This symptom presented nothing different from the usual description, either as to the physical qualities of the vomit, or the mode in which it was expelled. One point in this connection is, however, worthy of notice: the black vomit was observed in some cases for so long a period as six days; and as an example of this kind may be mentioned the case of Mr. Kent.

Again, we would call attention to the fact that the black vomit occurred with high temperatures—even so high as 104° . Recovery after black vomit, in adults, took place in a comparatively large number of cases. It has been observed that children frequently recover after the occurrence of this symptom; but experience has proved that in adults it is of very grave import.

So far as the appearances of the tongue were concerned, we cannot say that we observed anything that can be laid down as characteristic of the disease. It did not seem to us that the edges of the organ were particularly red or free from coating, or that the coating was confined to a stripe in the centre, as is often described; but there was what we thought a peculiarity about the coating. It did not present the appearance of a "furring," but as if the organ had been painted with dirty white paint, (in the early stages) which the papillæ slightly projected. This afforded a source of frequent discussion to Dr. Stuart and the writer of this note, and was remarked upon in nearly all the cases that came under our observation. Later on in the disease the tongue usually became brown, cracked, and often bled from the fissures of its surface.

The nervous system participated, as might be expected, in the commotion set up in the organism; but there

was no one symptom that attracted attention particularly, besides the characteristic headache, which was an early and invariable feature of the disease, referred as usual to the frontal region. This symptom seldom persisted beyond the first stage. Delirium was often observed, but it is worthy of note that it was rarely of a wild, active character; usually quiet muttering. In the late stages, especially if the disease passed beyond the stage of calm, the nervous system became profoundly affected, presenting the lethargy, somnolence and coma, marking blood poisoning, and giving most of those symptoms usually considered as owing their cause to uræmia, except convulsions, of which we saw no instance during the epidemic.

We pass on to a consideration of the phenomena of the urine, and regret that in our account of the affection of the organs chiefly concerned in this function, we are unable to give microscopic examinations. To make these was impossible under the exigencies of the service, when every moment was consumed in attention to the wants of the sick, leaving no time to the pursuit of pathological research.

As in nearly, if not quite all acute febrile diseases, the urine became scanty, saturated, and high colored, soon after the accession of the fever, earlier in this disease, perhaps, than in many others, because of the rapidity with which the temperature mounted up to its maximum height, being intense from its inception. Albumen in the urine has been frequently described as almost invariably present, and in marked quantity. It is also held by many, not only as an important symptom, but as one characteristic, and indeed almost, if not absolutely diagnostic of this fever. We are prepared to admit the frequency of its occurrence, and its importance as a symptom, but are not yet ready to go so far in endorsement of its exclusive diagnostic significance. High temperatures in other acute febrile diseases have had, as a result, albumen in the urine; it is

true, at a later period than in Yellow Fever. Whether in Yellow Fever the specific poison produces changes in the organs beyond those brought about by the disorganizing influence of the great heat of body, remains yet to be proved, and it is most worthy of investigation. Be this as it may, our observations show that so early as the second day, albumen was found in the urine, to the extent of one-third or one-half of volume, and a number of examinations proved the like result in each instance.

Suppression of urine was frequently observed, and as usual, was a symptom of grave import. Retention of urine occurred in a few cases, and was a most distressing symptom, requiring the catheter for its relief.

The yellow coloration of the skin, which is so characteristic of the disease as to have given to it the name that it bears, was marked in all except those cases that died at the end of forty-eight hours in collapse, and in some the color was of intense hue, which was nearer to mahogany than yellow. The skin presented no eruptions, except minute extravasations in one or two cases, if these may be so classed.

We pass on to other points, in connection with the epidemic, which, to us, are of much interest :

As we have already mentioned, Yellow Fever occurred for the first time in Port Royal last summer. The place is subject to malarial fevers, and is inhabited by people collected from all parts of the Northern States and from the interior of the Southern States. Under these circumstances we had the opportunity of studying Yellow Fever in a malarial region, in an unacclimated population.

In view of the divers theories held in relation to the existence of a malarial fever possessing symptoms, and running a course similar, if not identical, with that of genuine Yellow Fever ; and also considering the opinions advanced in reference to the different types assumed by the last named disease, we entered upon the

duty of attending and observing this epidemic with great interest, to gain, if possible, information on these vexed and contested points.

From what we have already said, we hope that we have made it evident to you that the epidemic presented those features and symptoms, which, taken separately, and in their peculiar groupings, are recognized as constituting specific Yellow Fever.

Considering first the types of Yellow Fever, we remember that, in 1871, the epidemic at Charleston presented fevers of types and forms so different as to give rise to much confusion as to their identity, and doubt in the minds of many as to whether they owed their origin to the same cause.

On the one hand, there was seen the Yellow Fever, of unmistakable character, marked by those symptoms characteristic of the disease, whilst on the other hand, an ephemeral form of fever prevailed at the same time, which was variously designated as Dengue, Breakbone, "the Prevailing Fever," mild Yellow Fever, and Febricula.

In the one, the mortality varied from twenty to forty per cent.; in the other, the mortality was none, or very small, whilst in all cases, taken together, without distinction of type, the death rate was 0.36 per cent., as estimated from 1,177 cases.

We have elsewhere given a description of these different forms of fever, and our reasons for considering them as of different nature, and not due to the same poison. (*Trans. Amer. Med. Association, Vol. 23, 1872.*)

The epidemic at Port Royal presented no such variations of type; all the cases of Yellow Fever were well marked, and offered no difficulties of diagnosis. There were no so-called mild cases. In using this expression we do not desire to convey the idea that they were all of equal severity and malignancy.

They varied greatly in their severity, in the violence of the symptoms, and in the rapidity of their course;

but they all presented the peculiar grouping of the characteristic symptoms of Yellow Fever.

There were no cases such as Rush included in his third class, viz.: "those in whom the miasmata acted so feebly as not to confine them to their beds or houses;" nor did we see any of those cases mentioned by Gillkrest, where there was "not a single, well marked symptom of fever."

There were no cases of Dengue or Breakbone, or "acclimatizing fever."

We have already stated that Port Royal is subject to malarial fevers, and of these forms many cases were seen and recognized.

Here we come to a point in the history of the epidemic under consideration, which, to us, constitutes one of the most important results of its study, viz.: the diagnostic distinction between malarial fever and Yellow Fever.

Veitch, in his letter to the commissioners for transports and sick and wounded seamen, published in London in 1818, uses the following expression: "The confounding the remittent fever with the ardent fever of strangers in a tropical climate, is not the result of the difference between them passing unobserved, but it often arises from an injurious tendency to generalize."

By this system of generalization, during an epidemic, we are almost always too apt to assign to its influence all forms of fever, irrespective of symptoms and their groupings, under the idea that Yellow Fever may present unlimited varieties of types and phases, and also by reason of the dogma that in the presence of one disease of power in epidemic form, all others give way before it, disappear, or assume its "livery." In other words, hybrid or mongrel forms of disease result from such combinations.

In the epidemic under consideration, we have no hesitation in asserting that the malarial fever and the Yellow Fever remained distinct in their course, in no

way modified each other, and did not give rise to hybrid types.

The natural clinical history of the diseases arising from these two special and distinct disease-poisons, is sufficiently marked and well known to you to render it unnecessary for us to contrast them.

The thermometric records of the diseases alone were, in all cases, with rare exceptions, sufficient to establish the distinction; were this not enough, the different results obtained by the administration of Quinine would set all doubt at rest.

A clinical thermometer and thirty grains of Quinine established the diagnosis invariably, even without taking into consideration the other distinctive differences that were plainly evident.

In the first place, all those who went to Port Royal to aid in attendance on the sick, who took Quinine daily, escaped attacks of malarial fever, whilst on the other hand, those who neglected this precaution, suffered with well marked remittent fever.

The colored nurses who were sent by the Howard Association, of Savannah, and who had gone through the epidemic in that city in 1876, suffered with such attacks.

The history of these cases of malarial fever was briefly this: The men were all attacked at night with chill, followed, immediately, by headache and fever, the thermometer marking 104° and in some cases 105° . A dose of Quinine, gr. xx, was administered immediately; during the night the fever abated, sweating occurred, and in the morning the patients were almost, if not entirely, free of fever, and resumed their duty within forty-eight hours. In some instances there were slight recurrences of fever, which Quinine controlled, without the individuals taking to bed.

In illustration of the correctness of these observations, we will mention a few cases that came under our treatment.

Mr. B., an engineer of the Port Royal Railroad, ran the engine, which was the only mode of transportation between Port Royal and Beaufort. In the afternoon, about 6 o'clock, we saw Mr. B. sick, lying on the bench in the cab of the engine; he had severe fever and headache, and was put to bed in the hotel, the "Mansion House." Thermometric observation gave a temperature of 105° in the axilla; a hot mustard foot-bath was given, and a dose of gr. xx of Quinine. During the night the fever passed off; he had a profuse sweat, and the next morning we met him on the road to the Railroad "Round House," apparently in his usual health, only a little weakened by his attack. By advice he left Port Royal immediately, with the admonition to continue taking Quinine for some days.

Mr. D. had a so-called mild case of Yellow Fever in Charleston, in 1871, he being a stranger, from Virginia, and that being his first summer in this region. On October 7th, 1877, he was attacked in the evening with chill, and fever of a high grade, with temperature of 105° , followed; Quinine was administered as soon as he came under treatment. In the morning the fever had considerably remitted; the Quinine was continued during the day; the fever rose again at night, another large dose of Quinine was given, and the next morning he was free of fever. On the 10th visits were discontinued, and he had regained his usual health in two or three days more.

With the views that we entertain of the non-protective influence of the mild cases of fever of the Charleston epidemic of 1871, we advised Mr. D. to leave Port Royal, but with the usual pluck of the Virginian, and influenced by a determination not to abandon his friends in distress, who needed the aid of the few people of the town who were well enough to nurse them and attend to their wants, he remained. On the 19th of October he was attacked, as we have since been informed by Dr. H. M. Stuart, with a ma-

lignant case of Yellow Fever, and narrowly escaped with his life.

If this evidence of the genuine malarial nature of these cases were not sufficient, it is further confirmed by the fact that almost daily during the epidemic individuals came, suffering from intermittents, which ran their course with good days and bad days, according to their types, which were not influenced in their periodic recurrence by the giant fever that was prevailing.

The influence of acclimation and previous attacks in conferring immunity against Yellow Fever, was formerly believed in, but of late years faith has been somewhat shaken. The causes for this failure of belief may possibly be found in the prevalence in the epidemics since 1850, of mild cases of Yellow Fever, which, as has been frequently proved, do not confer immunity from subsequent attacks, and in the fact that many who supposed themselves acclimated had lost the immunity afforded by it through prolonged absence from the geographical region of the disease.

Acclimation, not impaired by the reasons just mentioned, and genuine attacks of Yellow Fever in epidemics really appeared, on this occasion, to be protective, and there was no instance noted in which such individuals suffered.

This immunity was severely put to the test. Dr. Sheftall, of Savannah, Dr. Lea, of Charleston, Mr. Rogers, of Savannah, volunteer apothecary, and the writer of this note, together with the nurses from Savannah, were quartered in the hotel, the "Mansion House," in which were as many as eight cases of Yellow Fever daily and nightly, without injurious result.

Among the people of the town, all those escaped attacks of Yellow Fever who were acclimated, or had suffered from well marked attack of the disease on previous occasion, and there was no exception to this statement, in our opinion.

Mr. D.'s case was the only one which might, by

some be considered as an exception to this assertion. He had a "mild" attack of fever during the epidemic of 1871, in Charleston, but it has been already shown in the history of that epidemic that these "mild" cases did not exempt from attacks of true, well-marked Yellow Fever. Indeed, we have elsewhere given instances in which those who had suffered such "mild" attacks died subsequently during the same epidemic with Yellow Fever.

Mr. T., a native of Charleston, was a most remarkable instance of the immunity conferred by acclimation. He was, at one time, the only individual of the white people of the town who was sufficiently well to be about and attend to business matters.

The treatment has had no new light thrown upon it by the experience of this epidemic, except to settle in our mind two points.

The first of these is, the inutility of the administration of Quinine—nay, more—the absolutely injurious effect that it produced in Yellow Fever cases.

Without doubt, it failed to diminish the temperature to any appreciable degree, and had not the slightest effect in shortening the duration of the fever, or in reducing the severity of the symptoms.

Its physiological effect upon the pulse can not be regarded as beneficial; for, as we have already seen, a slow pulse, disproportionately slow to the high temperature, is one of the marked peculiarities of the disease.

Another injurious effect of the drug was manifested in the irritability of the stomach, that really seemed to be increased by its administration.

Again, another prejudicial influence was that exercised on the nervous system, manifested by increased headache and tendency to delirium.

The other point that has been settled to our conviction, is the uselessness and injurious result of the application of blisters over the epigastrium, as so commonly employed. The objections to their use consist in

their failure to arrest the irritability of the stomach, in the occurrence of hemorrhages from the blistered surfaces, and finally in the intense distress produced by strangury brought about through their use.

The kidneys are evidently much affected in structure in Yellow Fever ; and it appears to us that an additional objection to the use of blisters may be found in the irritating effect of cantharides on these organs. These are the negative results of the observations on the treatment of the epidemic. Where it is necessary, by reason of lack of knowledge of the essential nature of a disease, and of a specific to counteract its effects, to treat symptoms, as might be expected, the views of individual practitioners differ as to the means by which the several indications are to be met.

So, on the occasion under consideration, the plans adopted were various, but the results did not materially differ.

Beyond one dose of Calomel and Quinine in the inception, these drugs were not employed. The latter, after the nature of the fever became fully declared, was only used as a means of diagnosing Yellow Fever from the Remittent fevers, already alluded to as prevailing at the same time to a great extent.

In the stages of capillary stasis and congestions, it was found useful to sponge the patients frequently from head to foot, trunk and limbs, with hot water and mustard, with the result of contributing very much to their comfort, and in some cases with apparently good effect on the disease.

Time having passed since the termination of the epidemic, we have endeavored to gather, in figures, the results.

Through the kindness of our friend, Dr. Stuart, of Beaufort, who attended during the whole epidemic, we are enabled to make an approximate estimate of the number of cases, and of the mortality. Under ordinary circumstances the population of the town is about four

hundred; of these two hundred and fifty are whites, and one hundred and fifty are colored.

Among these are included a number of railroad employees, engaged at the extensive shops of the Port Royal Railroad Company.

On the occurrence of a number of deaths from fever, and even before its nature was decided, many people left the town.

A census, taken on the 4th October, gave as the population then residing there: whites, ninety-four; colored, one hundred and thirty-seven. Total 231.

The total deaths were 25:—whites 24; colored, 1: children, 3; women, 8. Total cases, 183—whites, 96; colored, 87.

The last case of fever took place on the 9th November.

A number of these cases were malarial, and were so noted at the time of their occurrence; so that the mortality of the Yellow Fever, after the deduction of these from the total number of cases of fever, will be proportionately much higher than the figures represent.

In an investigation into the origin of the epidemic, it is most important that the date, location and circumstances connected with the first case should be definitely settled. We regret that this element of uncertainty cannot be satisfactorily removed, as the disease had evidently existed for some time before its nature was determined. It was not until the 3rd of October that the differences of opinion, in this respect, were reconciled.

For the events that took place before that date, we have to rely upon such information as we were able to obtain after we arrived, and some days after the disease made its appearance; for this reason it is difficult to fix dates.

Occurrences of importance, as viewed by the light of subsequent developments, did not, at the time that they took place, attract the attention that they would other-

wise have claimed. The first doubtful case of fever was that of Mr. McF., who was attacked on the 24th of August. Mr. McF. is a clerk in the shipping office of the Agent of the New York and Fernandina Steamers, and "has everything to do with the loading and unloading of these steamers, also with the Mexican; he slept on board of the Mexican; and when working late at night, on the New York Steamers, often slept the remaining portion of the night with the Purser."

The next case was said to have been that of Jack Brisbane, a colored man, on the 28th of August; he lived next door to Mr. McF., above Wilkins' store, and recovered.

We have some hesitation in accepting these cases as Yellow Fever; for the reasons, that in the second case we have no history, and in the first there were evidently no marked symptoms of the disease. Mr. McF. was taken sick on the 24th of August, and was seen by an accomplished physician on the 26th, who in speaking of the case says: "I saw him on the 26th; his fever was very high, but suspecting nothing peculiar, observed nothing."

Other reasons for doubting the genuine nature of this case are, that Mr. McF. was a good subject for the disease; and therefore, in accordance with the observation that the first cases of an epidemic are always severe, his case should have given symptoms peculiar to its nature. He recovered.

Again, between this case and the first undoubted case of Yellow Fever, according to our view, seventeen days elapsed. Another strong reason against accepting this case is, that, were it a true case, the disease was very much slower in spreading itself in a very susceptible population, than is usual in these epidemics.

We are, therefore, inclined to believe that the case of Mr. Pape was the first of the epidemic.

This case occurred on the 10th of September and

ended fatally, after having extended over a period of eight days. The case was not seen by Dr. Stuart until the 17th, the day that it terminated.

Mr. Pape kept a bar-room and beer garden, which was the common resort of the crews of the ships, and of the people of Port Royal.

Mrs. Wallace, who resided two doors from "Pape's Garden," died on September 19th. "She was seen by Dr. Clark, of the U. S. N., on the 17th, who said he observed nothing peculiar in her case. On the 18th, Dr. Battle, U. S. N., saw her and makes the same remark. I saw her body on the afternoon of the 19th, which was very yellow."

A number of intermittents and remittents were seen during this period, of which we have notes furnished us by Dr Stuart; all these cases recovered. On September 26th, Mr. Ballke, a German, was taken sick; he resided in the same house where Mrs. Wallace died. This case terminated fatally on the 29th.

On the 26th, Mrs. Lunt was taken sick, and died on the 29th, "having vomited a 'dark stuff,' as described by her husband, which was thrown away before I could see it. A man who pretended to know, informed me that it was not black vomit; now, I believe it was." She lived in the house known as Wilkins' Store, and we have heard since that she had been requested to wash clothes from the Steamer Mexican. This she refused to do, but it was done by a colored woman who lived on the same premises.

Mrs. Lunt received and took care of the infant of Mrs. Wallace, after the death of the latter.

On September 28th, Fritz Halliger, a German baker, was taken sick. In this case no urine was passed from the morning of the 30th to the morning of 1st October, when a little, with "yellow sediment," was voided. Suppression then became complete, but there was a discharge of pus from the urethra. This patient had black vomit on the evening of October 1st, and died on

the 2nd. We saw the body of Fritz Halliger, which was of deep yellow color, approaching mahogany, and it was evident that black vomit had been pouring from the mouth.

Willie Halliger, son of Fritz Halliger, was taken with the usual symptoms, on September 29th, but recovered after a mild attack.

On September 29th, the Quarantine Officer was taken to Beaufort, sick with a fever.

On 29th September, Mrs. Eaton was attacked, but she quickly convalesced.

On 29th, H. McGinley was attacked, but recovered after a tedious sickness.

September 29th, Mrs. Foster was attacked with the usual symptoms of Yellow Fever; she subsequently died with black vomit.

September 30th, Jim Gerideau, colored, was attacked with Yellow Fever; he recovered.

October 1st, Mr. Wilkins was attacked with Yellow Fever, and died with black vomit on October 5th.

October 2nd, Joseph Cater, James Holmes, Mr. Keener, and Mr. Kent were attacked,

Mr. Keener was the first case on the "hill," at the workshops of the Port Royal Railroad; he had black vomit, but finally recovered.

Mr. Kent was taken just after Mr. Keener, and died on the 9th of October, having had black vomit for six days.

On October 3d we arrived in Port Royal, and an inspection of the body of Fritz Halliger, who died on October 2nd; and an examination of the cases of Mrs. Foster, Mr. Wilkins, Mr. Kent, and Mr. Keener, satisfied us of the nature of the disease by which we were everywhere surrounded.

It is unnecessary to mention cases further, as the disease spread from this time with great rapidity; this can be judged of from the following summary, taken

from the telegrams that we sent to the President of the Medical Society of South Carolina :

October	3rd,.....	22	patients.
"	4th,	25	"
"	5th,.....	36	"
"	6th,	40	"
"	7th,.....	45	"
"	8th,.....	47	"
"	9th,.....	34	"
"	10th,	27	"

In these telegrams the term "patients," was used to express what we now mention, viz : that the cases were not all Yellow Fever, but that some of them were well marked Remittents, and were so reported in the telegrams giving details, that were sent every evening to the Superintendent of the Port Royal Railroad.

The summary just given will show that from the beginning of the disease, which we put down at the 10th September, it spread with great rapidity, the number of cases increasing from day to day until the 8th October, and then gradually diminishing. The epidemic ceased rather from the failure of material, but the disease continued to pick off one by one those who had not been previously affected, until a heavy frost put a stop to its work.

The next question that interests us is, the source from which the disease originated.

The three aspects in which this subject presents itself for consideration may be simply stated in these propositions :

1st. Was the epidemic of local origin? If so, to what was it due?

2d. Was it imported?

3d. If imported, by what means?

It is manifest to those who have ever undertaken to study out the evidence bearing on these points in con-

nection with an epidemic, that it is almost, if not entirely impossible to settle this important matter to the satisfaction of all beyond controversy.

There are always so many elements of difference of opinion, not only as to deductions, but also concerning the facts upon which they are based, that uncertainty rests in all cases upon the results of the investigations instituted for the clearing up of this important subject.

In regard to the first proposition, we would admit that we believe in the possibility, nay probability, in many cases, of the occurrence of Yellow Fever in epidemic form within certain geographical limits, from local causes, and that Port Royal is located within these bounds.

We endeavored to prove the local origin of the disease of the epidemic of 1871 at Charleston, and the evidence has not been controverted.

In entering into the investigation of the epidemic of 1877 at Port Royal, we certainly did not feel so prejudiced or warped in our judgment in favor of importation as to seek to suit facts to preconceived notions. We have endeavored simply to find the truth, and in the statements that follow, this object has been kept continually in view.

The first proposition resolves itself into two inquiries :

1st. Did the disease arise from the revivification and propagation under favorable circumstances of pre-existing specific germs of Yellow Fever. ?

2d. Did it arise, *de novo*, from the unknown combination of atmospheric and telluric influences, or the unsanitary condition of the town due to appreciable and discoverable causes ?

In relation to the first inquiry, we think that such origin of the epidemic is very improbable, as the disease, so far as we could learn, has never existed in Port Royal before, and moreover no such revivification of germs took place in Beaufort, So. Ca., four miles from Port Royal, where Yellow Fever prevailed as an epidemic in 1871.

In relation to the second inquiry, we are compelled likewise to give a negative opinion.

In the first place, we found nothing in the condition of Port Royal, that appeared to us especially to predispose to disease, and so far as we could be guided by the developments of sanitary science known to us, we were constantly on the look out to note such things as seemed to us might possess influence in the production, or contribute to the extension of the disease.

From negative evidence we are likewise inclined to discard the theory that the disease originated *de novo*, from the operation of unknown influences, atmospheric and telluric, especially as we see good reason to account for the origin in another direction.

We adopt this view for the reason that Beaufort is situated only four miles from Port Royal, on the same island, and subject to the same apparent climatic influences, yet this town, under the trying circumstances of proximity to an epidemic, escaped attack of the disease, although three cases went there from Port Royal to die.

We are strengthened in this opinion by the fact that Beaufort has on three occasions suffered from Yellow Fever, first in 1817, next in 1854, and also in 1871.

The third proposition then, for these reasons presents itself for our consideration as the only theory left for us to hold; we must look to the shipping.

The following information was derived from inhabitants of Port Royal, of acknowledged responsibility, who had ample opportunity to observe the events and occurrences of which they spoke.

The Barkentine Kioto, Captain Long, arrived at Port Royal July 22nd, from the West Indies; she had been laying there some ten or twelve days. She came right up to the wharf, where she arrived about 9 o'clock, on the morning of July 22nd. After being at Port

Royal for four days, she discharged all the crew, and they remained there about twenty-four hours, some going afterwards to Charleston and some to Savannah.

The vessel, before loading, discharged earth ballast, which still remains on the Railroad Wharf. She left Port Royal on September 19th, and dropped down to Bay Point, where she remained for over two weeks, on account of the sickness of the captain.

The Schooner *Lewis Ehrman* from Navassa, arrived at quarantine August 17th; came to the wharf on the 18th; discharged guano, and left for Bull River. It was reported that she lost two men with Yellow Fever in the West Indies.

The Steamship *Mexican* arrived at Port Royal August 21st, from Port au Prince (it is said by some Port au Platte). She had been in fourteen different ports in the West Indies. It is said that she left one man at Port au Prince (Port au Platte) sick with Yellow Fever. The washing of this ship was done at two places in the town, as already mentioned; one of these was next door but one to the house in which the first case occurred; the other place was on the same premises where Mrs. Lunt died. The people of the town visited the vessel both day and night, and the officers and crew went to Wilkins' store continually. She left Port Royal September 12th.

This ship was not quarantined, and the captain remarked in the presence of several persons that he was very much surprised that he had not been detained at Quarantine.

The Steamship *City of Austin* arrived at Port Royal from Fernandina, August 24th, and either left the same day, or according to some accounts, remained about 30 hours. It is said that when she arrived at New York, a man who was a passenger, was taken from the ship at Staten Island, and died. In regard to this statement, we have not been able to learn positively the accuracy, or whether this ship has been confounded

with the City of Dallas, which made a trip the next week.*

The Austin remained at Port Royal a number of hours, sufficiently long to discharge 8 or 10 packages, (it is said of bags,) and to allow her passengers and crew to walk all about the town, and to permit time to the inhabitants to visit the ship. Among other places the passengers and crew went to "Pape's Garden."

It was openly stated by the passengers and crew, and we have been told by the captain also, on their arrival at Port Royal, that when they left Fernandina, Yellow Fever was prevailing there, and that a number of deaths had occurred.

It is difficult to say, to which of these ships is to be attributed the importation of the disease.

We are embarrassed by the richness of the grounds on which the theory of importation can be based; the possibility that they may all have contributed their quota; and finally by the difficulty in deciding the date and circumstances of the first case.

Let us consider first the Kioto; she arrived from a West Indian port on July 22nd, with a clean bill of health, and none of her crew were sick or became so subsequently, as far as has been learned.

Are we to take it for granted that the crew were liable to the disease, or, on the other hand, that they

*Since this paper was read before the Association, the following information, in relation to the Steamer City of Austin, has been kindly sent us by Dr. S. O. Vanderpool, Health Officer of New York, in reply to a letter from us. "City of Austin arrived here about August 27th or 28th, having a *clean bill of health*, and received pratique; afterward a passenger and one of the crew were taken sick; both died of Yellow Fever—the former at the New York Hospital and the other at the Seamen's Retreat. Post-mortems were made in each case, to verify the diagnosis. City of Austin arrived again September 11th, having again a *clean bill of health*. After two days' detention two of the crew were taken sick with Yellow Fever, one of whom died."

"City of Dallas had no sickness. After September 11th these vessels did not go to Fernandina."

escaped by reason of acclimation or previous attack, or that they had not been exposed to the poison of Yellow Fever?

It is known that frequently in Charleston men have been found ill, who died under circumstances which were very suspicious of Yellow Fever; indeed, an instance of this kind occurred last summer at the Police Station. The man was a sailor; was taken from the wharf of the Savannah and Charleston Railroad, and was carried to the Police Station, in Charleston, where he died, the body being yellow and the clothes stained with what was supposed to be black vomit. May this not have been one of the men who were discharged from the Kioto, and went to Charleston?

This question cannot be positively answered in the affirmative, but the doubt is sufficient to cause us to consider the interrogatory: "Did she bring the fever?"

The only other point of interest that the history of this ship may develop to some of us, is presented by the fact that she deposited "earth ballast" on the Railroad Wharf. It has been said that this was sand ballast; but to us this is a distinction without a difference.

We saw and examined this ballast, and there is scarcely any necessity for us to recall to the Association the importance that ballast has of late years assumed as a disease carrier.

Although we have assumed that the first case occurred on the 10th of September, it is not too much for us to admit, did we not have other sources of greater probability, that even under the combined influence of the summer's sun and moisture, the disease germs contained in such ballast, may have taken time to generate, propagate, and increase to a degree sufficient to extend themselves to the town, and produce their peculiar infection.

In relation to the Schooner *Lewis Ehrman*, we will only allude to the report that she lost two men in the

West Indies with Yellow Fever. This report was obtained from the crew, and may, therefore, be considered of some value, as they had no object in deceiving the quarantine authorities; we received it from a gentleman resident of Port Royal, who, in former days, "followed the sea," and sees a great deal of the seamen who go to Port Royal.

The Mexican had recently been at fourteen different points in the West Indies, and the peculiar coincidence between the washing of the clothes from this ship and the two early cases, is worthy of notice; and it is further worthy of remark, that the boatswain said that there had been cases on the ship. In this connection, let us not forget that the captain of the Mexican remarked, in the presence of several persons, that "he was very much surprised on not being quarantined." The sailors of the Mexican sold a great many old clothes, in Port Royal, to the negroes.

To add still another to the suspicious points, in connection with this ship, it remains to mention that the steward told a highly respected citizen of Beaufort, that a man from the ship had been sent to the hospital, at the last port at which they had touched, and that the case had been pronounced there to be Yellow Fever. The surgeon of the ship, on being questioned, had replied that "he had not pronounced it such," but did not declare what he thought about it.

So far as the steamer Austin is concerned, it is certain that she sailed from Fernandina to Port Royal, after the disease had broken out there, and several deaths had occurred. We must, therefore, admit that the Yellow Fever poison was in the atmosphere of the first named town for at least fourteen days before the ship sailed. This ship arrived at Port Royal on August 24th, it is true, with nobody sick on board.

This fact does not move us at all from the opinion that she could have brought the atmosphere of Fernandina laden with the germs of Yellow Fever in her

hold, adhering to the packages that she discharged, and to the clothing of her passengers and crew.

It may be said, that as she arrived on the 24th August, and the first case, according to our own showing, occurred on the 10th September, the period of time between these two events was too remote to establish a connection, the one with the other.

In reply, we would say, in the first place, that the period of incubation of Yellow Fever is undetermined, extending between three days, when the poison is concentrated under epidemic influence, and the subject is predisposed to it, and three weeks, under different circumstances.

In the instance under consideration, the interval between the arrival of the *Austin*, and the occurrence of the first case, was sixteen days. It is not too much to ask, that we allow the poison two days' grace over the average period of fourteen days' incubation, to propagate and increase itself for its powerful attack.

We have dwelt upon this ship especially, as it is she that has been questioned in relation to the origin of the disease.

By reference to the books of the Shipping Office, the following information has been obtained:

Austin, from *Fernandina*, arrived at Port Royal August 10th.

Dallas, from *Fernandina*, arrived at Port Royal August 17th.

Austin, from *Fernandina*, arrived at Port Royal August 24th.

Dallas, from *Fernandina*, arrived at Port Royal August 31st.

Dallas, from *Fernandina*, arrived at Port Royal September 14th.

Austin, from *Fernandina*, arrived at Port Royal September 23rd.

Dallas, from *Fernandina*, arrived at Port Royal, September 29th.

From this statement it seems to us that we may take our choice between the Dallas and the Austin, or the Mexican; and taking either, not go wrong.

It is certain that none of these ships were disinfected thoroughly before they arrived at Port Royal; indeed, there are no means, as we are inclined to state from our observations on the quarantine of the State, reported to the Association at the last session, to carry out this process efficaciously. The State has not provided its officers with those means which constitute the very essence of the theory of quarantine.

Under these circumstances, we are not surprised that although there were no cases of the disease on the ships at the time of their arrival, they might have the poison secreted in their holds, to be liberated on their arrival, and let loose on an unsuspecting and unprepared people.

An important point to be considered in this connection is, that on the "Hill," where stand the houses of the Railroad operatives, situated at a distance from the wharves and shipping, but few cases occurred, and of these, the first two were in men who frequented the lower part of the town nightly.

There remain but two questions to be considered in regard to the origin of the fever.

Did the specific poison of Yellow Fever originate in the driving of piles in constructing or reconstructing the wharves of the Port Royal Railroad?

We are compelled to give our opinion in opposition to this view; for we saw this process, and found that the material being used for the piles, was green pine trees from the woods of Carolina, with the rosin dripping from them under the influence of the sun, through the cracks and bruises made by the piling machine.

The other question is, whether the ponds behind the town, (the nearest a quarter of a mile off,) and the decaying and decayed wood and vegetable matter around their borders, are competent to produce the disease-poison of specific Yellow Fever?

It is useless to enter into this discussion; similar circumstances can be found every where in the State with the same result, viz: the production of malarial fevers.

The history of the epidemic at Shreveport, Louisiana, in 1873, has pretty well settled the question that malarial poisoning, in the common acceptation of the term, is not the same as specific Yellow Fever poisoning.

In the "Report of the Committee on the Yellow Fever epidemic of 1873, at Shreveport, Louisiana," it is stated that, "It is a fact that from fifty to one hundred men have been constantly employed during the season clearing out the raft [the Red River Raft], and not one case of Yellow Fever has occurred among them." With this evidence, we must exclude the "Battery Ponds" from any part in the causation of the epidemic that we have just been engaged in considering.

There certainly cannot be a more fit occasion than the present, whilst we are considering the origin and history of an epidemic of a dreadful and fatal disease that nearly wiped from existence a prosperous and promising seaport town of the State of South Carolina, to refer to the responsibility of the government of a State in such matters.

It will be remembered by the members of this Association, that at the last meeting we presented a Report from the Committee on State Medicine and Public Hygiene, in which we endeavored to point out the condition of the State of South Carolina, in relation to this important subject. We then took occasion to bring to your attention the defects in the quarantine system now in operation in this State, and pointed out to you wherein its failure consists. We then observed that the appropriation made by the Legislature for this important institution was only two thousand dollars, and that this amount was expected to cover the expenses of all the four quarantine stations on the coast. We regret to inform you that since that time our law-givers have

still further reduced the appropriations, and that they now amount to scarcely one thousand dollars per annum, as we have learned from good authority.

It is manifest to you, therefore, that quarantine in this State exists only in name.

We have been informed by the best authority, that during the past summer the Health Officer of the State, who has under his care the administration of the extensive and elaborate quarantine laws of the State, was compelled to pay out of his own pocket for the telegrams by which he kept himself informed as to the progress of disease in this country and abroad; and it is evident to you that it is only by the possession of this knowledge that he is enabled to apply intelligently the scanty means provided by the State to warding off the approach of epidemics from the communities that look to him for protection from imported disease.

Is there no way in which this important subject can be brought to the consideration of our Legislators? This Association has done good work in this regard; has made offers to the Government to give the time, skill, and labor of its members to the subject, and has only met with rebuff.

It is time that the matter should be brought to the notice of the people, and it is to be hoped that through them the ear of the law-givers may be reached.

Are we asking too much of you, when we call your attention to the occurrence of an imported disease, in connection with the diminution of the appropriation for the support of one of the means by which it is to be guarded against?

Let it not be supposed that we believe that quarantine alone will preserve us from these evils. A thorough system of sanitary laws and the means of enforcing them are necessary. We will not, however, enter further into the consideration of this question at the present time.

In conclusion, we would say that the people of Port

Royal owe a debt of gratitude to Dr. H. M. Stuart, of Beaufort, So. Ca., that they cannot ever fully pay, for his devotion to them from the beginning to the end of the epidemic.

To Dr. Sheftall, of Savannah, Dr. Lea, of Charleston, and Mr. Rodgers, Apothecary, of Savannah, is due the highest consideration for their excellent services under the trying circumstances in which they voluntarily placed themselves, through their enthusiastic devotion to the philanthropic objects of our order.

Charleston, S. C., March, 1878.

